

Middle Middle Miocene Aggradational Play

MM7 A1, #1641

Cibicides opima through *Bigenerina humblei*

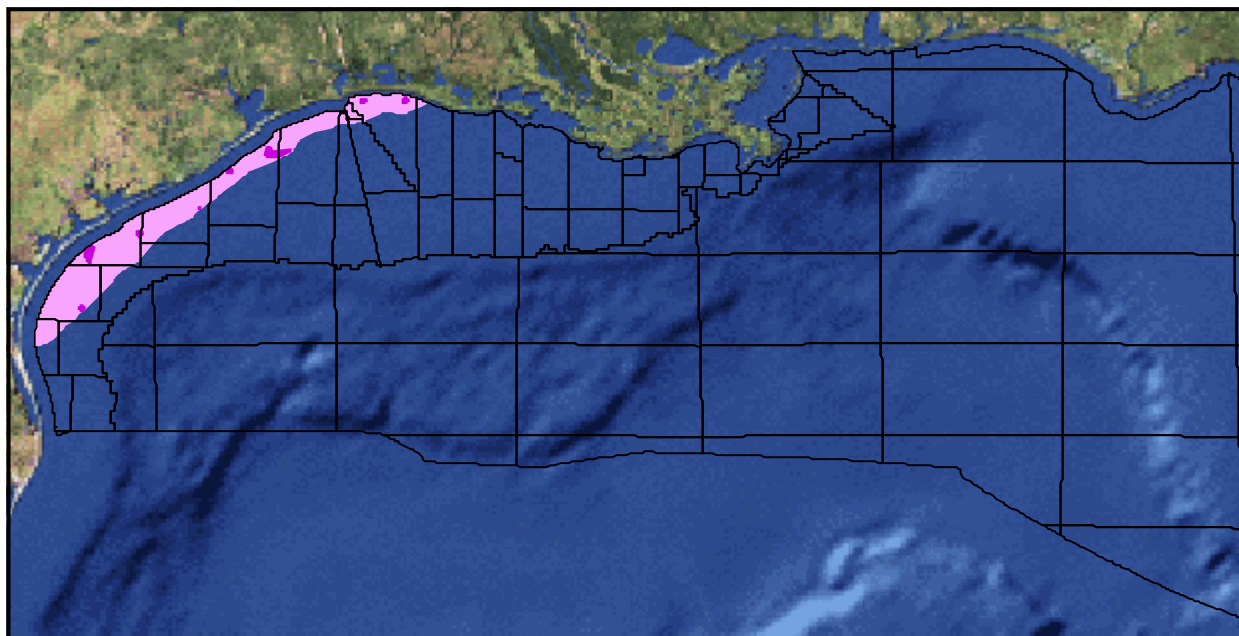


Figure 272. MM7 A1 map showing location of play. Play limit shown in light magenta; hydrocarbon limit shown in dark magenta.

Overview

The Middle Middle Miocene Aggradational Play (MM7 A1) contains reserves of 91.668 Bcfg and 0.541 MMbo (16.852 MMBOE) in 22 sands in 10 fields. The play extends continuously across the modern GOM shelf from the North Padre Island to East Cameron Area ([Figure 272](#)).

Description

MM7 A1 is defined by (1) an aggradational depositional style representing sediment buildup in continental to shallow marine shelf environments and (2) the MM-5, MM-6, and MM-7 Chronozones, the tops of which are defined by the *Cibicides opima*, *Cristellaria* "I", and *Bigenerina humblei* biozones, respectively ([Figure 8](#)).

MM7 A1 extends continuously across the modern GOM shelf from the North Padre Island Area offshore Texas to the northwestern-most East Cameron Area offshore Louisiana ([Figure 272](#)). Hydrocarbons have been discovered in only a few,

scattered clusters across the play area, probably because of the scarcity of sealing shales in the sand-rich, aggradational depositional environment.

Instead of two separate delta systems supplying sediment to the offshore Texas area like in lower middle Miocene (MM4) time, a single large delta system, the South Brazos, became the dominant supplier of sediment in MM7 time, as the North Padre Delta System shifted much farther inland with the widespread MM4, *Amphistegina* "B" flooding event (Morton et al., 1985). The South Brazos Delta occupied what had previously been an interdeltaic embayment (Morton et al., 1985). The ancestral Mississippi River Delta System supplied sediment to the Louisiana offshore in MM7 time.

No significant shift eastward or westward of MM7 aggradational sediments from the underlying MM4 Chronozone is observed. However, MM7 A1 extends across the Brazos and Galveston Areas as the South Brazos Delta System prograded into this area.

Play Limits

Updip, the play extends onshore into Texas and Louisiana. To the southwest, the play continues onshore into Texas. To the east, the play continues onshore into Louisiana. Downdip, the play either grades into the sediments of the Middle Middle Miocene Progradational Play (MM7 P1) or is limited by the Middle Middle Miocene Structural Corsair Play (MM7 S1).

Depositional Style

MM7 A1 is characterized by stacked, blocky, sand-dominated successions representing sediment buildup on a (1) stream plain (e.g., fluvial channel/levee complexes, crevasse splays, and point bars); (2) delta plain (e.g., distributary channel/levee complexes, crevasse splays, distributary mouth bars, bay fill, intertidal deposits, and beach/barrier island deposits); and (3) shallow marine shelf (e.g., delta fringe sands and delta slump deposits). These sands are often coarse grained and exhibit a blocky log signature that may show an upward-fining character at the top.

In the productive areas, MM7 A1 often comprises a significant portion of the MM7 section not only in terms of net sand development but also total MM7 section thickness. Across the Texas offshore, the MM7 aggradational interval varies from approximately 50 to more than 4,600 ft in thickness, with net sand thicknesses as much as approximately 1,400 ft. In the more limited offshore Louisiana area, the interval varies from approximately 400 to more than 1,800 ft in thickness, with net sand thicknesses as much as 600 ft. Individual sands, up to a few hundred feet thick, are interbedded with shales that are usually only a few tens of feet thick, but locally can be a few hundred feet thick. Much of the MM7 A1 interval does not contain hydrocarbons because of sparse sealing shales.

Structural Style

The majority of fields in MM7 A1 are structurally associated with anticlines and normal faults. Less commonly, growth fault anticlines occur.

Quantitative Attributes

On the basis of reserves calculations, MM7 A1 contains 97% gas and 3% oil. The 22 sands in the play comprise 25 reservoirs, of which 22 are nonassociated gas, 2 are undersaturated oil, and 1 is sat-

	No. of Sands	Oil (MMbbl)	Gas (Bcf)	BOE (MMbbl)
Proved	22	0.541	91.668	16.852
Cum. production	17	0.471	70.346	12.988
Remaining proved	12	0.069	21.323	3.863
Unproved	0	0.000	0.000	0.000

Table 129. MM7 A1 reserves and cumulative production.

urated oil. All reserves are proved and estimated to be 91.668 Bcfg and 0.541 MMbo (16.852 MMBOE) (Table 129). These reserves account for only 1% of the reserves for the MM7 Chronozone.

Cumulative production from MM7 A1 totals 70.346 Bcfg and 0.471 MMbo (12.988 MMBOE) from 17 sands in eight fields. This production accounts for less than 1% of the MM7 Chronozone's total production. Remaining proved reserves in the play are 21.323 Bcfg and 0.069 MMbo (3.863 MMBOE) in 12 sands in seven fields.

Table 130 summarizes that water depths of the fields in MM7 A1 range from 32-88 ft, and play interval discovery depths vary from 2,695-7,450 ft, subsea. Additionally, porosity and water saturation range from 26-36% and 16-46%, respectively.

22 Sands	Min	Mean	Max
Water depth (ft)	32	62	88
Subsea depth (ft)	2,695	4,975	7,450
Reservoirs per sand	1	1	3
Porosity	26%	31%	36%
Water saturation	16%	25%	46%

Table 130. MM7 A1 sand attributes. Values are volume-weighted averages of individual reservoir attributes.

Exploration History

MM7 A1 has a 44-year history of discoveries (Figure 273). The first sand in the play was discovered in 1955 in the West Cameron 45 Field. The maximum number of sands discovered in any year occurred in 1977 with four sands from the Matagorda Island 665 Field. These sands also accounted for the maximum reserves added in any year, with 6.037 MMBOE. Almost half of the play's reserves had been discovered by the end of 1977.

The largest sand in the play was discovered in 1977 in the Matagorda Island 665 Field and contains an estimated 3.846 MMBOE (Figure 274). The mean sand size for the play is 0.766 MMBOE. Since the first Atlas database cutoff of January 1, 1995, three sands have been discovered, the largest of which is estimated to contain 1.285 MMBOE.

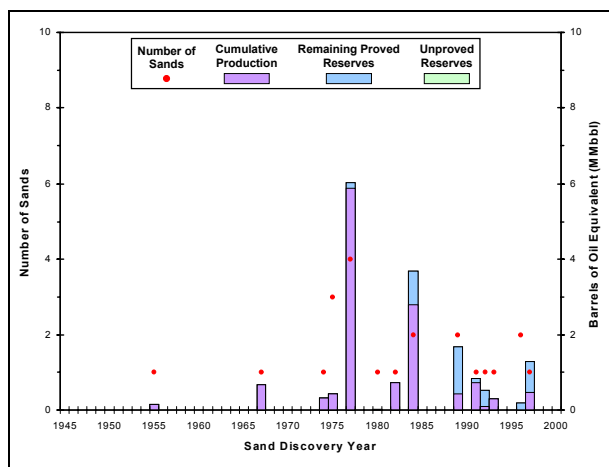


Figure 273. MM7 A1 exploration history graph showing reserves and number of sands discovered by year.

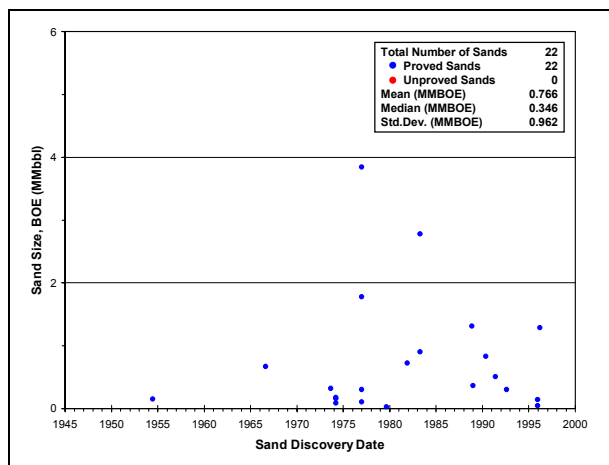


Figure 274. MM7 A1 sand discovery graph showing the size of sands discovered by year.

Production History

MM7 A1 has a 31-year history of production (Figure 275). Production from the play began in 1963, a nine-year lag from the first discovery in the play. After four years, production ceased in the only field producing from the MM7 A1 play, West Cameron 45. After a two-year hiatus, production once again commenced from the West Cameron 45 Field, but steadily declined after 1970. Production again was halted from 1975 through 1977, but began again in 1978 when the West Cameron 66 Field started producing from the play. Both oil and gas production fluctuated during the following two decades, with gas production peaking in 1989 and oil in 1985. However, oil production has always been a very minor component of the overall production. Gas production in 1998 was 60% lower than the peak level of 1989.

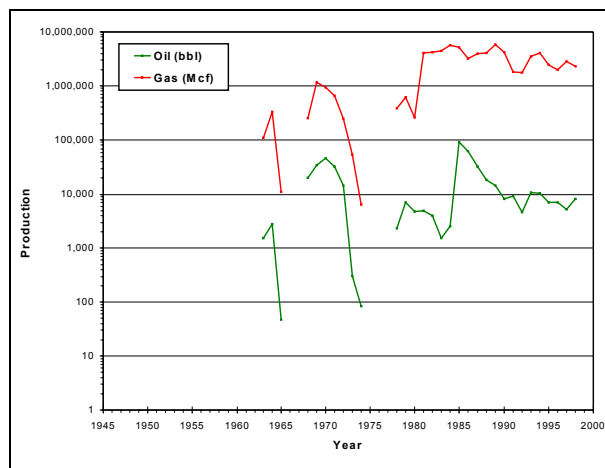


Figure 275. MM7 A1 production graph showing oil and gas production by year.